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Index 979
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	) TANK AND CAP ASSEMBLY FOR
	) USE WITH MICROCHANNEL
GREGORY T. KOHLER et al	) TUBING IN A HEAT EXCHANGER
	)
Serial No. 10/047,670	) Group Art Unit 3753
	)
Filed January 15, 2002	) Examiner Leonard R. Leo

TRANSMITTAL OF APPELLANTS' BRIEF ON APPEAL

Mail Stop Appeal Briefs-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Enclosed herewith are the following:

(1) Brief on Appeal (including an Appendix of Claims) in regard to the above-referenced patent application; and

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37 CFR 1.8
CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Appeal Briefs-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on January 23, 2006.

Signature: Karen Sanderson

Name: Karen Sanderson

(2) A check in the amount of $500.00 to cover the fee set forth in 37 CFR §1.17(c).

If any additional fees are required, they should be charged to our Deposit Account No. 23-0785.

Respectfully submitted,

WOOD, PHILLIPS, KATZ,
CLARK & MORTIMER

By _____
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APPELLANTS' BRIEF ON APPEAL

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Sir:

REAL PARTY IN INTEREST

The real party in interest is Modine Manufacturing Company.

RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences.

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STATUS OF CLAIMS

Claims 1-15 are pending. Claims 2 and 15 are withdrawn from consideration. Claims 3, 4, 6, 7, 9, 10, 12 and 14 are objected to. Claims 1, 5, 8, 11 and 13 are rejected.

STATUS OF AMENDMENTS

There have been no amendments filed subsequent to final rejection.

SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 is directed to a heat exchanger including a flattened tube 10, a cap 14, and a tank 16. (Page 6, lines 1-10 and Figs. 1-4, 6, and 7) The flattened tube 10 includes a port 22 extending into an end of the tube 10. (Page 6, lines 11-21 and Figs. 1-2) The cap 14 has a generally centrally located slot 28 sized to snugly receive the end and allow the tube 10 to pass through the slot 28. (Page 7, lines 6-19 and Figs. 1-4, 6, and 7) The cap 14 has a body in which the slot 28 is formed and an exterior surface nominally concentric with the slot, with the exterior surface having a tube facing side 24 and an opposite side 26 spaced therefrom. (Page 7, lines 6-19 and Figs. 1-4, 6, and 7) The periphery of the cap 14 at the tube facing side 24 is larger than the periphery at the opposite side 26. (Figs. 1-4) The tank 16 has a body with a cap receiving end 40, a fluid receiving or discharging end 42 spaced from the cap receiving end, an interior cavity 48 opening to the cap receiving end 40, and a port extending from the cavity at a location remote from the cap receiving end 40 to a location at or near the receiving or discharging end 42. (Page 8, lines 5-15 and Figs. 1-5) The cavity 48 has a stepped wall including a first section 50 sized to

snugly receive the cap tube facing side 24, a second section spaced from the first section and sized to abut the tube end without blocking the internal port 22 thereat, and an intermediate section 54 between the first and second sections 50,52 and sized to abut the cap 14 at a location between the tube facing side 24 and the opposite side 26 when the tube facing side 24 is received in the first section 50. (Page 8, line 16 - page 9, line 18, Figs. 1-5) The tank 16 receives the cap 14 with the intermediate section 54 acting as a cap stop to limiting entry of the cap 14 into the tank 16 and the second section 52 acting as a tube stop limiting entry of the tube 10 into the cavity 48. (Page 9, lines 3-18, Figs. 1-5)

Claim 13 is directed towards a heat exchanger as described above in connection with claim 1. Claim 13 further characterizes the opposite side 26 as being an opposite crowned side 26 (Figs. 1-3), the interior cavity 48 as having an oval cross section, the first section 50 as being an oval-shaped first section 50, the second section 52 as being an oval-shaped second section 52 and the intermediate section 54 as being an oval-shaped intermediate section 54. (Figs. 1-5) Claim 13 also recites a collar 30 disposed about the slot 28 and located on said opposite crowned side 26. (Page 7, lines 8-10, Figs. 1-3)

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1, 5, 8, 11 and 13 are rejected under 35 U.S.C. 103 as being unpatentable over Kocher US 2,134,719; Brogan US 3,923,323; or Turner et al US 4,146,254 in view of Dalo US 4,945,983 or Ando US 5,105,877.

ARGUMENT

Referring to the primary references (Kocher, Brogan and Turner), none of these references disclose "a heat exchanger" as recited in the present claims. Rather, all of the references are directed towards fluid couplings. The Final Office Action attempts to overcome the obvious shortcomings of these three references by asserting that "the novelty of the instant invention is not solely based on the heat exchanger structure, rather the structure providing fluid coupling of components to define a heat exchanger." Regardless of the accuracy of this assertion, it is respectfully submitted that none of the references are "reasonably pertinent to the particular problem with which the applicant was concerned" because each of the references is directed towards removably, round tube couplings, whereas Applicants' invention is directed towards a brazed (thus nonremovable) heat exchanger construction utilizing a flat tube, rather than a round tube. See *In re Oetiker*, 977 F.2d 1443 (Fed. Cir. 1992) and MPEP §2141.01(a) and cases cited therein. There is nothing in the three primary references that "logically would have commended itself to an inventor's attention in considering" the problem of connecting a flattened tube to a tank and cap construction of a heat exchanger in a brazed connection. Id. It is respectfully submitted that the three primary references were selected using hindsight simply to find the specific structural description given for the tank and cap components in the claims, rather than following the guidelines set forth in MPEP §2141.01(a) and the cases cited therein. Accordingly, for this reason alone, all of the rejections are improper and should be withdrawn.

Additionally, the attempted combination of any of the primary references (Kocher, Brogan and Turner et al.) with any of the secondary references (Dalo, Ryan et al. and Ando) is improper. As illustrated in the primary references, Kocher, Brogan and Turner et al. each disclose couplings specifically designed for round tubes. Yet, as seen in the secondary references, Dalo, Ryan et al. and Ando each disclose flattened tubes for use in a heat exchanger. The attempted combination of round tube couplings with flattened heat exchanger tubes is improper because there is no motivation or suggestion as to the desirability of modifying the round couplings by substituting the flattened heat exchanger tubes. In fact, the secondary references teach away from their use in the primary references. Specifically, the secondary references all concern flattened tubes that are brazed to a header. The primary references all disclose removable round tubes which by their very nature cannot be brazed because they are designed and intended to be removable. There is nothing in any of the references that suggest that flat tubes would be desirable or an improvement to any of the round tube couplings of the primary references. The Office Action asserts that the secondary references teach that round tubes and flat tubes are interchangeable, but, at best, this can only be a teaching that they are interchangeable in heat exchangers and particularly those of a brazed construction. The secondary references do not and cannot suggest anything with respect to the round tube couplings of the primary references. Thus, the Office Action has failed to establish a *prima facie* case of obviousness and the rejection should be withdrawn. See MPEP §§2142 and 2143 et. seq. and cases cited therein for the standards requiring a *prima facie* case of

obviousness. For this reason alone, the rejections are all improper and should be withdrawn.

Furthermore, the combination of any of the secondary references with any of the primary references would require changing the principal of operation of the primary references and/or render the primary references unfit for their intended purposes. This is not allowable when attempting to combine references. See §2143.01 V stating that "If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification," and MPEP §2143.01 VI stating that "If the prposed modification or combination of the prior art would change the principal of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obviousness." For example, all of the primary references rely on some sort of compression to secure the round tube to the coupler and to provide a leak-proof seal. This structure, which utilizes the principal of compression would have to be completely changed to allow for flattened tubes. This is because the round tubes of the primary references evenly distribute the pressure around the tube and the round shape of the tube provides strength. This is not possible with the flat tubes of the secondary references because the flat sides of the flat tubes would have a greater amount of compression and would therefore begin to cave in. The flat structure does not provide the same hoop strength and resilience as round tubes. Therefore, the principal of operation of the primary references would have to be changed to accommodate the secondary references. Additionally, if the secondary references were combined with the primary

references, the primary references would be unsuitable for their intended purpose. Specifically, the primary references disclose fluid couplings that allow the round tubes to be disassembled/removed, whereas the secondary references all, at best, teach that round and flat tubes can be interchanged in a brazed construction. Thus, even if the primary references are modified by the teachings of the secondary references, the flat tubes would have to be brazed to the couplers to accommodate the flat tubes of the secondary references. If the flat tubes were brazed to the couplers, the structure could not be disassembled. Therefore, for these additional reasons, the rejections are improper and should be withdrawn.

In summary, it is respectfully argued that there is no motivation under §103 because the primary references are for removable type round tube connections, whereas the secondary references:

(1) at best teach that it is desirable to replace flattened tubes and round tubes in a brazed heat exchanger construction, and teach nothing with respect to a removable coupling such as is shown in the primary references; and

(2) there is no teaching or suggestion that it would be desirable to substitute the flattened tubes of a brazed construction (Applicants are here arguing about the structure shown in the references, not structure recited in Applicants' claims) for the round tubes of the removable fluid connections of the primary references. Absent a suggestion that it would be desirable to replace flattened tubes for the

round tubes of a removable coupling such as shown in the primary references, a *prima facie* case has not been established.

Additionally, in response to Applicants' prior arguments, the Final Office Action asserts that:

> In this case, the secondary references of Dalo et al, Ryan et al or Ando teach circular tubes and flattened tubes are obvious alternatives to one another. There is no novelty in employing a known tube cross-section with another known tube cross-section, especially when the prior art explicitly discloses the obvious substitutions.

There has not been a single reference cited in the rejections that teaches that flat tubes are an obvious alternative or obvious substitute for round tubes in a removable, compression type coupling such as disclosed in each of the primary references. Absent such a teaching, the rejections fail to establish a *prima facie* case of obviousness. At best, the secondary references teach the desirability with respect to brazed connections, which if used in the primary references would render the primary references unsuitable for their intended purpose and completely change the principle of operation of each of the primary references because a brazed connection as taught by the secondary references would not allow for a removable connection, nor would it allow for the compression type of sealing arrangement. This is not allowed in making a rejection under §103.

CONCLUSION

In view of the foregoing, Applicants respectfully request withdrawal of the rejection of claims 1, 5, 8, 11 and 13 and the objections to claims 3, 4, 6, 7, 9, 10, 12 and 14, and allowance of the case.

Respectfully submitted,

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APPENDIX OF CLAIMS

1. A heat exchanger, comprising:

a flattened tube including a port extending to an end of the tube;

a cap having a generally centrally located slot sized to snugly receive said end and allow said tube to pass fully through said slot, said cap having a body in which said slot is formed and having an exterior surface nominally concentric with said slot, said exterior surface having a tube facing side and an opposite side spaced therefrom, the periphery of said cap at said tube facing side being larger than the periphery at said opposite side; and

a tank having a body with a cap receiving end, a fluid receiving or discharging end spaced from the cap receiving end, an interior cavity opening to said cap receiving end, and a port extending from said cavity at a location remote from said cap receiving end to a location at or near said receiving or discharging end, said cavity having a stepped wall including a first section sized to snugly receive said cap tube facing side, a second section spaced from said first section and sized to abut said tube end without blocking the internal port thereat, and an intermediate section between said first and second sections and sized to abut said cap at a location between said tube facing side and said opposite side when said tube facing side is received in said first section;

said tank receiving said cap with said intermediate section acting as a cap stop to limit entry of said cap into said tank and said second section acting as a tube stop limiting entry of said tube end into said cavity.

3. The heat exchanger of claim 1 wherein said cap exterior, intermediate said sides, is a convex shaped dome.

4. The heat exchanger of claim 3 wherein said slot has a flared concave end at said tube receiving side.

5. The heat exchanger of claim 1 wherein said cap, at said opposite side, includes a tube receiving collar surrounding said slot thereat, said collar extending into said cavity.

6. The heat exchanger of claim 5 wherein said cap exterior, intermediate said sides, is a convex shaped dome.

7. The heat exchanger of claim 5 wherein said slot has a flared concave end at said tube receiving side.

8. The heat exchanger of claim 1 wherein said tank includes a stub in which said port is located.

9. The heat exchanger of claim 1 including at least one tang at the interface of said tube and said slot and sized to provide an interference fit between said tube and

said cap to hold said tube in said slot during assembly without preventing disposition of said tube in said slot.

10. The heat exchanger of claim 9 wherein said at least one tang is on said cap within said slot and engages a wall of said tube.

11. The heat exchanger of claim 1 wherein said interior cavity, adjacent said receiving or discharging end, has a cross sectional shape of an oval.

12. The heat exchanger of claim 1 wherein said interior cavity, adjacent said receiving and discharging end, has a curved surface converging on said port.

13. A heat exchanger, comprising:

a flattened tube including a plurality of internal ports extending to an end of the tube;

a cap having a generally centrally located slot sized to snugly receive said end and allow said tube to pass fully through said slot, said cap having a body in which said slot is formed and having an exterior surface nominally concentric with said slot, said exterior surface having a flat tube facing side and an opposite crowned side spaced therefrom, the periphery of said cap at said tube facing side being larger than the periphery at said opposite side, a collar on said body and disposed about said slot and located on said opposite crowned side; and

a tank having a body with a cap receiving end, a fluid receiving or discharging end spaced from the cap receiving end, an interior cavity having an oval cross section and opening to said cap receiving end, a stub on said fluid receiving and discharging end, and a port extending from said cavity at a location remote from said cap receiving end through said stub to a location at said receiving or discharging end, said cavity having a stepped wall including an oval-shaped first section sized to snugly receive said cap tube facing side, an oval-shaped second section spaced from said first section and sized to abut said tube end without blocking the internal ports thereat, and an intermediate oval-shaped section between said first and second sections and sized to abut said cap at a location on said opposite crowned side when said tube facing side is received in said first section;

said tank receiving said cap with said intermediate section acting as a cap stop to limit entry of said cap into said tank and said second section acting as a tube stop limiting entry of said tube end into said cavity.

14. The heat exchanger of claim 13 wherein said second section is domed and oval-shaped.

EVIDENCE APPENDIX

There is no evidence that has been entered by the Examiner and relied upon by Appellant.

RELATED PROCEEDING APPENDIX

There has been no decision by a Court or the Board in any proceeding identified pursuant to (c)(1)(ii) of 37 C.F.R. §41.37.